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I may terminate this review of these exquisite organic products by a pretty tale from the Talmud, teaching us that the people of that day esteemed but one object in nature of higher value than pearls.

It tells us that when Abraham approached Egypt he locked Sarah, his wife, in a chest that none might behold her beauty. But when he came to the place of paying customs the officer said to him, "Pay custom." And he said, "I will pay the custom." They said to him, "Thou carriest clothes;" and he said, "I will pay for clothes." Then they said, "Thou carriest gold;" and he replied, "I will pay for gold." On this they cried, "Surely thou bearest the fine silk;" and he answered, "I will pay custom for the finest silk." Then they said, "Surely it must be pearls that thou takest with thee;" and he only answered, "I will pay for pearls." As they knew of nothing more valuable than pearls, they demanded that the box should be opened in order that it might be determined what concealed treasure it was for which the owner was willing to pay customs even as for fine pearls. And the box was opened, and then, as now, beauty and virtue, idealized in woman, were acknowledged of earthly treasures to be as pearls of great price.

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## CATLINITE.

### ITS ANTIQUITY AS A MATERIAL FOR TOBACCO PIPES.

BY EDWIN A. BARBER.

"From the redstone of the quarry  
 With his hand he broke a fragment,  
 Moulded it into a pipe-head,  
 Shaped and fashioned it with figures;  
 From the margin of the river  
 Took a long reed for a pipe-stem,  
 With its dark green leaves upon it;  
 \* \* \* \* \*  
 And erect upon the mountains,  
 Gitche Manito, the mighty,  
 Smoked the calumet, the Peace-pipe,  
 As a signal to the nations."

*Hiawatha.*

For many generations the native tribes of the United States have procured a highly-prized material for the manufacture of their tobacco pipes at the Great Red Pipestone quarry, situated on that

portion of the dividing ridge between the Minnesota and Missouri rivers, denominated by the early French settlers, *Côteau des Prairies*. There has been some discrepancy in the statements of travelers in regard to the exact location of this source of aboriginal supply. Carver informs us that near the Marble river "is a mountain, from whence the Indians get a sort of red stone, out of which they hew the bowls of their pipes."<sup>1</sup> Dr. Charles Rau, in an article entitled "Ancient Aboriginal Trade in North America," quotes from Loskiel,<sup>2</sup> principally in reference to the pipes of the Delawares and Iroquois: "Some are manufactured from a kind of red stone, which is sometimes brought for sale by Indians who live near the Marble river, on the western side of the Mississippi, where they extract it (*sic*) from a mountain." Du Pratz erroneously located the quarry "on the bank of the Missouri,"<sup>3</sup> but, for obvious reasons, he was, in all probability, misinformed by the natives.

Catlin, who was the first white man permitted by the Indians to visit the place, describes it as being situated between the St. Peters and Missouri rivers, "in a direction nearly west from the Fall of St. Anthony, at a distance of three hundred miles."<sup>4</sup> According to Dr. C. A. White, the quarry lies in Minnesota, about thirty miles from its south-western corner, and three or four miles from its western boundary.<sup>5</sup> Dr. F. V. Hayden, who visited the locality some years ago, writes of it as follows: "On reaching the source of the Pipestone creek, in the valley of which the pipestone bed is located, I was surprised to see how inconspicuous a place it is. Indeed, had I not known of the existence of a rock in this locality so celebrated in this region, I should have passed it by almost unnoticed. \* \* \* \* The pipestone layer, as seen at this point, is about eleven inches in thickness, only about two and a quarter inches of which are used for manufacturing pipes and other ornaments. The remainder is too impure, slaty, fragile, &c. \* \* \* \* A ditch from four to six feet wide and about five hundred yards in length, extending partly across the

<sup>1</sup> Travels through North America, Dublin, 1779, p. 95.

<sup>2</sup> Smithsonian Report, 1872, p. 372.

<sup>3</sup> *Ib.* p. 369.

<sup>4</sup> Illustrations of the Manners, Customs and Condition of the North American Indians. Ninth ed., London, 1857, p. 171, Vol. II, Letter 54.

<sup>5</sup> Vide AMERICAN NATURALIST, Vol. II, p. 644.

valley of Pipestone creek, reveals what has thus far been done in excavating the rock.”<sup>1</sup>

Professor I. N. Nicholet observes: “This red pipestone, not more interesting to the Indian than it is to the man of science, by its unique character, deserves a particular description. In the quarry of it which I opened, the thickness of the bed is one foot and a half; the upper portion of which separates in thin slabs, whilst the lower ones are more compact. As a mineralogical species, it may be described as follows: Compact; structure slaty; receiving a dull polish; having a red streak; color blood-red, with dots of a fainter shade of the same color; fracture rough; sectile; feel somewhat greasy; hardness not yielding to the nail; not scratched by selenite, but easily by calcareous spar; specific gravity 2.90. The acids have no action upon it; before the blow-pipe it is infusible *per se*, but with borax gives a green glass.”<sup>2</sup>

Dr. C. T. Jackson, of Boston, to whom Catlin sent specimens, pronounced it a new mineral, and gave to it the name of *catlinite*.

The Great Red Pipestone quarry of the North-west has been the theme of some of the most interesting myths of the North American Indians. Aside from the testimony of early eye-witnesses of the customs of the native tribes, some of these legends, which have been handed down through many successive generations, in various portions of the United States, would seem to indicate that the material had been employed in pipe-sculpture for a considerable length of time. Nearly all of these traditions of the Sioux, Mandans, Knisteneaux and other tribes,<sup>3</sup> as narrated by Catlin and other writers, while they differ somewhat in detail, appear to be simply modifications of Longfellow's version, as embodied in his “Song of Hiawatha.” In addition to savage mythology, facts are not wanting to prove the comparative antiquity of the aboriginal operations at *Côteau des Prairies*. “There are indications,” says Dr. Hayden, “of an unusual amount of labor on the part of the Indians in former years to secure the precious material.”<sup>4</sup>

The narratives of many of the early writers contain allusions to catlinite. The Jesuit missionary, Marquette, who smoked the pipe of peace with the Indians as early as 1673, describes the imple-

<sup>1</sup> *Am. Jour. Sci. and Arts*, Vol. XLIII, Jan., 1867, p. 19.

<sup>2</sup> Senate Doc. No. 237, Twenty-sixth Congress, Second Session, 1840-'41.

<sup>3</sup> See Wilson's “Prehistoric Man,” London, 1862, Vol. II, p. 11, et seq.

<sup>4</sup> *Am. Jour. Sci. and Arts*, Vol. LXIII, Jan., 1867, p. 20.

ment as being "made of a polished red stone, like marble, so pierced that one end serves to hold the tobacco, while the other is fastened on the stem, which is a stick two feet long, as thick as a common cane, and pierced in the middle; it is ornamented with the head and neck of different birds of beautiful plumage; they also add large feathers of red, green and other colors, with which it is all covered."<sup>1</sup>

The red stone to which this writer alludes was, in all probability, the pipestone of Minnesota.

"The pipe of peace," remarks Carver, "which is termed by the French, the calumet, for what reason I could never learn, is about four feet long. The bowl of it is made of *red marble*, and the stem of it of a light wood, curiously painted with hieroglyphics in various colors, and adorned with the feathers of the most beautiful birds."<sup>2</sup>

"This *Calumet*," writes Father Hennepin, "is the most mysterious Thing in the World among the Savages of the Continent of the Northern *America*; for it is us'd in all their important Transactions: However, it is nothing else but a large Tobacco-Pipe made of *Red, Black or White Marble*: The Head is finely polished, and the Quill, which is commonly two feet and a half long, is made of a pretty strong Reed or Cane, adorn'd with Feathers of all Colours, interlac'd with Locks of Women's Hair. They tie to it two Wings of the most curious Birds they find, which makes their Calumet not much unlike Mercury's Wand, or that Staff Ambassadors did formerly carry when they went to treat of Peace. They sheath that Reed into the neck of Birds they call Huars, which are as big as our Geese, and spotted with Black and White; or else of a sort of Ducks who make their nests upon Trees, tho' water be their ordinary Element, and whose feathers are of many different Colours. However, every Nation adorns the *Calumet* as they think according to their own *Genius* and the Birds they have in their country."<sup>3</sup>

Mr. John F. Watson, in his "Annals of Philadelphia," quotes

<sup>1</sup> Dis. and Ex. Miss. Val., by J. G. Shea, New York, 1852. Father James Marquette's Narrative, p. 35.

<sup>2</sup> Carver's Travels, Dublin, 1779, p. 336.

According to Mr. Shea, "We are probably indebted to Father Marquette for the addition to our language of this word" (calumet). (Dis. and Ex. Miss. Val. Note p. 21.)

<sup>3</sup> A New Discovery, etc., p. 93. London, 1698.

Quoted by Col. C. C. Jones in "Antiquities of the Southern Indians."

from the work of the Swedish traveler, Professor Kalm, in reference to the Indians, preceding the year 1748: "The old tobacco-pipes were made of clay or pot-stone, or serpentine stone—the tube thick and short. Some were made better, of *a very fine red pot stone*, and were seen chiefly with the sachems."

During the last century catlinite pipes were in general use amongst the various Indian tribes of the United States. The recent historians devote considerable space in their works to the description and illustration of these characteristic aboriginal productions.

Schoolcraft figures a number of Dakota pipes, one of which represents a tomahawk and another is a curious pipe with two rectangular bowls,<sup>1</sup> one placed behind the other and entirely distinct. Catlin has also published many sketches of calumets which he saw in his travels. He also made an interesting collection of these objects, which fell into the hands of the indefatigable collector, Mr. Wm. Bragge, F.S.A., of Birmingham, England (which collection I learn has been recently sold), in which was an unfinished bowl from the quarry, a pipe in the form of a canoe, a Pawnee catlinite pipe representing a buffalo cow in front of the bowl and a calf at the back, and weighing nearly three pounds—in all a series of thirty specimens, many of them beautifully inlaid with metal.

The red pipestone is still much sought for by the modern Indians, and pipes of this material are common amongst the Santees, Poncas, Apaches, Comanches, Sioux, Cheyennes, Arapahoes, Utes and, indeed, almost all the tribes east of the Rocky mountains. In nearly every public and private ethnological museum of any importance, modern examples occur, but these are generally inlaid with lead, silver, tin or some other metal, and frequently show the influence of civilization in their designs, being made in imitation of iron hatchets, spear-heads, knives, the heads of horses or other objects, animate or inanimate, of European introduction. A fine specimen of the horse-head form, elaborately inlaid with lead or pewter, is now in the museum of the Davenport Academy of Sciences, and a somewhat similar example, made by the Da-

<sup>1</sup> See "The History, Condition and Prospects of the Indian Tribes," Part II, pl. 69.

Dr. C. S. Arthur, of Portland, Ind., owns a double-bowled catlinite pipe very similar to that mentioned above, but possessing an upright ridge on the horizontal neck.

kota Indians, I procured from Professor E. H. Crane, of Colon, Michigan, who informs me that this tribe employs over seventy-five different patterns in pipe manufacture, of which the *calumet* is the only form for which they evince any degree of veneration in their ceremonies. This traveler saw the Indians take the material from the quarry and subsequently fashion it into pipe-bowls. The process of making catlinite pipes employed by the Sioux at the present day, is thus described to me by Mr. Chas. H. Bennett, of Pipe Stone City, Minnesota: A piece of the rock is selected from the best portion of the vein and the Indian sculptor, with an old piece of hoop iron, or a broken knife blade which he has picked up, fashions the block roughly into the desired form. Then slowly and tediously, with the same tools, he bores out the bowl and the hole in the stem, before carving the exterior, so that if, in the process of boring, the stone should split, no labor will be lost. After this is accomplished he shapes the surface into any design which he may have in view. This work often occupies weeks before it is completed, after which the carving is polished by rubbing it with grease or oil in the palms of the hands. Some of the more elaborate examples are inlaid with silver, lead or type-metal in the following manner: The portions to be inlaid are first cut out of the surface and a strip of heavy paper, first moistened, is wound tightly around the carved portions. Through a hole in the paper the melted metal is poured in until it fills all of the spaces. The wrapping is then removed and all of the uneven surfaces of metal rubbed smooth. These inlaid portions represent bands around the bowl or stem, or are made in stars, circles or geometrical devices, which give to the pipe a very ornamental appearance. Fig. 1 represents a carved pipe, two-thirds of the size of nature, which was sent to me by Mr. Bennett, made by a celebrated pipe maker belonging to the Flandreau Sioux. The material of this specimen is the purest and finest which I have ever seen, the color being a beautiful deep red.

According to Professor N. H. Winchell, of Minneapolis, the Chippewa Indians, at the present time, inlay the gray pipestone with red catlinite to produce a showy effect. One of these, in the famous Bragge collection in England, is made of dark stone inlaid with white metal *and catlinite*, from Pembina, Minn.

One of the finest catlinite pipes of recent date was owned by the celebrated chief of the Sacs and Foxes, Keokuk, which was

formerly the property of Dr. E. H. Davis, of New<sup>3</sup> York, but is now in the Blackmore Museum at Salisbury, England. This is figured in the first volume of the "Smithsonian Contributions to Knowledge," on the 230th page, though it is [there represented less than half the size of the original, while another illustration of it in *Harper's Monthly Magazine* for June, 1855, is further reduced in size, and is placed with three of the celebrated ancient mound pipes of Squier and Davis, beneath which occurs the simple legend "Indian Pipe-bowls."

The long stems of the calumet, which have, for many genera-

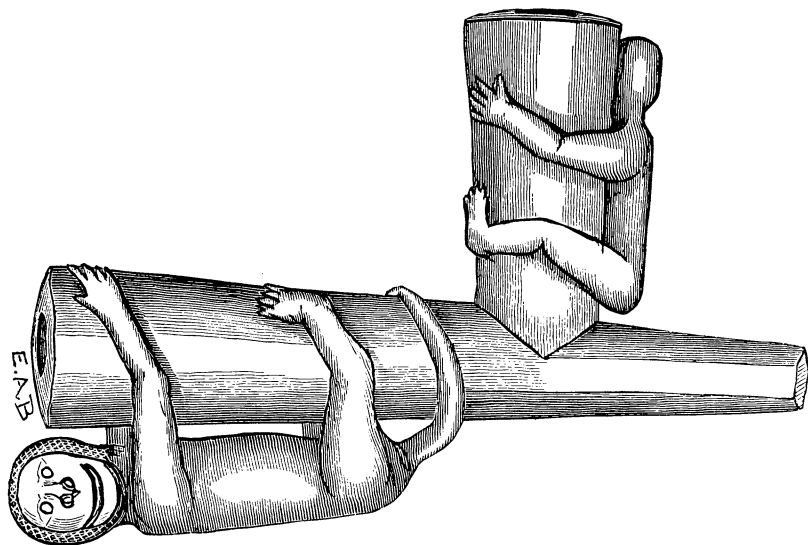


FIG. 1.—Calumet with carving of ape and boy.

tions, played such important parts in the wars, treaties and religious ceremonies of the Indian tribes, deserve a passing notice. Modern examples are often ingeniously made and profusely decorated with stained feathers, porcupine quill wrappings, bead work, human hair, gaudily-colored cloth and other ornamental trimmings. Specimens in my own collection are twisted and the spiral edges of the wood ornamented by charred designs. One flat stem in the collection of the Davenport Academy of Sciences is beautified with carvings of hearts and arrows which pass entirely through the center of the broad side. The stem hole which, if straight or following the pith, should intersect the open spaces, evidently passes around them; we are at a loss to know how such a result could be reached with the tools at the command of the



native workman. A stem belonging to a pipe from one of the Western Territories, in the collection of Philip Sharples, of West Chester, Pa., is closely wrapped with plaited moose hair, which is ingeniously stained in various colors with geometrical devices and representations of men and women. Another example presented to the writer by John H. McIlvain, of Philadelphia, is similarly ornamented with narrow braids of plaited porcupine quill-work, and was at one time the property of Eagle Head, a Sioux chief in the vicinity of the Falls of St. Anthony. The latter specimen was formerly in the old Peale Museum of Philadelphia. According to Mr. C. H. Bennett, the Indians in producing the twisted stems, which are generally made of ash wood, "cut a long strip of paper or cloth, wind it spirally about the stick and then cut along the edges of the wrapping. The hole is of course burned out with hot wire."

In olden times, as tradition has it, the Great Pipestone quarry was held as neutral ground where hostile tribes "buried all their warlike weapons" and peacefully met together to secure the gift which the Great Spirit had provided for their mutual benefit. Later, however, the territory, which includes the *Côteau des Prairies*, has been monopolized by the Sioux, and other tribes have only been able to procure the valued commodity by barter. A few years ago Professor Crane saw three hundred Yankton Sioux on their annual pilgrimage to the quarry, for the purpose of obtaining material to supply their own demands and for exchange with other tribes. Mr. Bennett, who has devoted much attention to this subject, writes me as follows: "The Yankton Sioux have no title or patent to the one mile square reserve, farther than that stipulated in the treaty made by Government with them about thirty years ago. The treaty is still in force, and the right of the Indians to dig pipestone for making pipes will belong to them as long as the treaty holds good. A gentleman of Minneapolis claims the west half of the mile square which has the pipestone diggings and the falls on, and is the most valuable part, through a patent erroneously issued by the Government a number of years since. The old head chief, Padanipapa or *Strike-the-Ree*, says he saw 6000 Indians camped at the quarry for two months about forty years ago.

In regard to the antiquity of catlinite as a material for pipe manufacture, there is a great diversity of opinion. Some writers

believe that the pipestone quarry was not opened before the commencement of the present century, whilst others agree with Mr. George Catlin in the belief that the natives were familiar with the peculiar properties of the stone and worked the quarry in far remote times. Professor Crane is of the opinion that pipestone has been extracted from this locality for many centuries, basing his belief upon the discovery of catlinite objects in ancient mounds in connection with other relics of undoubted antiquity. He assures me that he has found large quantities of chips and small fragments of red pipestone scattered over the country in the vicinity of Sioux falls, Dakota, and was told by an aged man of considerable intelligence that the latter had opened a mound in that neighborhood, a few years ago, in which he discovered a catlinite pipe of the oldest mound form. Be this as it may, recent investigations have proved beyond doubt that this material has been employed by the Indians for a much longer time than has been generally supposed. A century or so ago, long, cylindrical, opaque glass beads of a dark red color were made, in imitation of catlinite, and were imported to the United States in large quantities for traffic with the natives. These have been found in great abundance in certain localities, as in Lancaster county, Pennsylvania, and in Montgomery county, New York, and other portions of the Eastern States. The idea of furnishing such objects was suggested to the early traders by the catlinite tubes or perforated cylindrical ornaments which were common amongst the Indians, and which were highly esteemed by them. The glass imitations soon superseded the native stone productions to a great extent and doubtless proved a profitable source of income to the importers of Indian trinkets.

Indian graves in Chester County, Pa., have produced some curiously fashioned catlinite beads, some of them shaped in imitation of barbed arrow-points and others four-sided tubes upwards of an inch in length.

A considerable number of catlinite pipes have been taken from graves, and also from some of the older tumuli. In the ethnological collection of the Smithsonian Institution are several pipes and ornaments of red stone which were found in Indian graves in the State of New York while digging the Oriskany canal. The Peabody Museum of American Archæology and Ethnology contains several minute pipes made of catlinite, which were discov-

ered by Mr. E. Curtiss under a cairn in Marion county, Kansas. Professor J. D. Butler, of Madison, Wisconsin, refers to a pipe recently presented to the Wisconsin Historical Society, by Ole Rasmussen, which was found in Waupaca county in 1880, at a depth of twenty feet beneath the surface of the ground, while digging a well.<sup>1</sup>

From a large number of such pipes, which have been brought to my notice, I have selected a few of the most striking forms for illustration in this paper. A catlinite pipe in the collection of Mr. A. F. Berlin, of Allentown, Pennsylvania, is represented in Fig. 2.

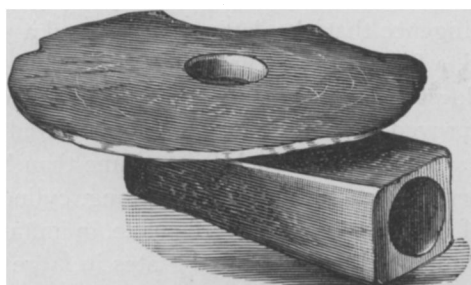


FIG. 2.—Pipe from Stark county, Ill.

This specimen was plowed up in a field in the vicinity of a mound near Elmira, Stark county, Ill. When found it was entire, but falling into the hands of the children of the finder, two pieces were broken from the edge of the broad horizontal disk which rests on the rectangular base. This pipe, which is carved from a single piece of stone, although not unique in form, may be considered a rare type. The illustration is nearly the size of nature, the basal portion measuring one and three quarters of an inch in length. The stem was fitted in by wrapping the end to fill the large orifice, which is scarcely less in diameter than the mouth of the bowl, which latter was doubtless designed to hold but a small quantity of tobacco, adulterated probably with other herbs, which, inhaled in the manner peculiar to the Indians, required but a small quantity to produce exhilaration or intoxication. Two other pipes of the same material and almost identical in form, are in possession of Dr. C. S. Arthur, the disks measuring four inches in diameter. In one of these a portion of the stem is carved in the semblance of an animal with one head, two bodies, two tails and six legs.

<sup>1</sup> See *Am. Antiquarian*, Vol. III, No. 2, p. 141.

Mr. J. P. Jones, of Keytesville, Missouri, possesses an example (Fig. 3) somewhat similar in shape to the preceding, with the ex-

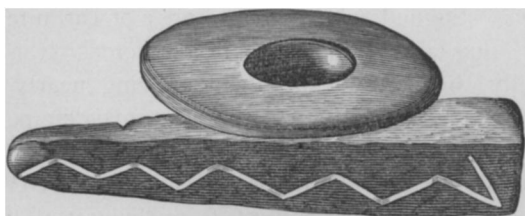


FIG. 3.—From a tumulus in Boone county, Mo.

ception that the platform is extended beyond the disk and tapers to a rounded point. A scroll or zigzag ornament is incised on either side. This specimen was taken from a small burial mound in Boone county, Mo. Another pipe, made of hard sandstone, of a somewhat analogous, but modified form, was found in Chariton county in the same State, and is owned by the same gentleman.

A pipe made of a light-colored stone, almost identical in form with Fig. 2, is in the collection of Mr. G. S. Mephram, of St. Louis, Mo. This was taken from a mound near Greenville, Illinois (see also Fig. 195, p. 49, *Archæol. Collections Nat. Mus.*, Rau).

Mr. Charles C. Jones, Jr., of Augusta, Georgia, remarks in his excellent work on the Indians of that State: "Thus far the writer has failed to discover a single instance of the use, among the Georgia Indians, in ancient times, of the genuine red pipestone or catlinite."<sup>1</sup> In a recent communication, however, he sends me a sketch of a small catlinite pipe, found in May, 1877, on the right bank of the Savannah river, in Columbia county, Georgia. Fig.

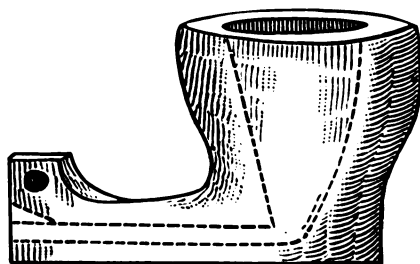


FIG. 4.—From Columbia county, Ga.

4 represents the object in its actual proportions. "In the same locality," writes Col. Jones, "was picked up a large cylindrical

<sup>1</sup> "Antiquities of the Southern Indians," p. 407.

bead, fashioned of the same material. In November of last year (1880), in the fork of the Patoiligo and Flint rivers (Southwestern Georgia), was obtained an oblong cylinder of catlinite, two and a half inches long and a half inch in diameter. It is perforated longitudinally, the diameter of the hole being nearly the quarter of an inch. Near one end occurs also a transverse perforation."

Dr. Charles Rau sends me a drawing of a pipe of unusual shape, which he mentions in his paper previously referred to.<sup>1</sup> "Its material," he writes, "is the real *catlinite* from the *Côteau des Prairies*, in Minnesota—dark red with lighter spots. The exact shape is shown in the accompanying drawing (see Fig. 5), which represents the object in its natural size. The pipe,



Fig. 5.—St. Clair shape known to me. It was ploughed up in a maize field near Centreville, St. Clair county, Illinois, and was sent to me eight or ten years ago, by Dr. John J. R. Patrick, of Belleville, in the same State and county."

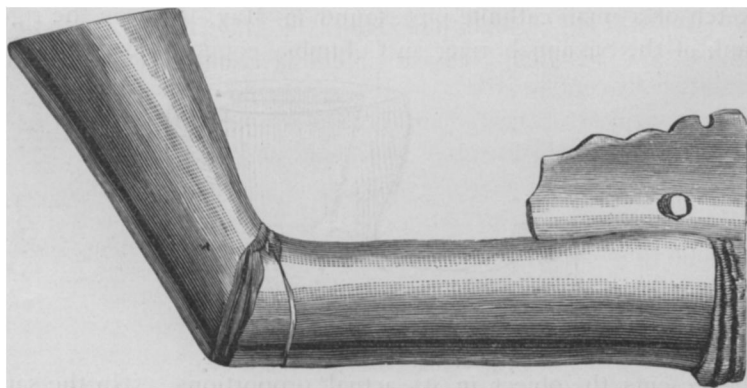


FIG. 6.—From a grave, Fort Wayne, Ind.

An example of red pipestone was discovered in a grave at

<sup>1</sup> See Smithsonian Report, 1872, p. 372.

Fort Wayne, Indiana, and is now owned by R. S. Robertson, Esq., of that city. It is represented in its actual size in Fig. 6. The form, while more modern than some of the other specimens figured, is not common at the present day. A few miles east of Fort Wayne, in Allen county, a curious pipe of the same material was found on the surface of the ground, a few years ago, which is now in the possession of Mr. H. J. Rudisill, of Riverside, California. A full sized drawing of this specimen is given in Fig. 7, and it will be seen that it is somewhat analogous in form to the interesting pipe described and figured by Mr. Henry Gillman, of Detroit, in his excellent paper on the "Mound-builders and Platy-nemism in Michigan,"<sup>1</sup> on which the figures 1697 have been scratched by some white man. The specimen illustrated in Fig. 189 in the "Smithsonian Contributions to Knowledge," No. 287, by Dr. Rau, belongs also to the same class. A pipe of similar form, but made of a gray stone possessing a reddish cast, is owned by R. W. McBride, Esq., of Waterloo, Indiana. As there is some doubt concerning the material of this specimen, it has not been figured here, although it has



FIG. 7. — From Allen county, Ind.

been pronounced catlinite by archæologists who have seen it. It was found on the surface, some years ago, on the present site of Waterloo. Another example in the same collection is given in Fig. 8. The material is supposed to be catlinite; it was taken from a mound in Putnam county, Ohio, about fifty years ago, by Dr. Jonas Emanuel. The head, which exhibits considerable artistic skill, is two and three quarters inches in height. The eyes and mouth are gouged out to a considerable depth, and may originally have contained pearls or nuggets of metal.



Mr. S. Z. Landes, of Mount Carmel, Ill., has a catlinite pipe which was recently found beneath the roots of a tree which had been undermined by the waters of White river, near that place. The bowl is plain, but on the upper portion of the horizontal neck an animal resembling a weasel is carved in high relief. It was found associated with copper ornaments, leaden bullets, a copper kettle, a physician's lancet and an iron box filled with mica.

FIG. 8. — From a mound in Putnam Co., Ohio.

<sup>1</sup> See Smithsonian Report, 1873, p. 369.

According to the report of Long's expedition to the Rocky mountains, published in Philadelphia in 1823, the old Philadelphia Museum contained at that time "many Indian pipes of that indurated clay found only (as far as hitherto known) on the Pipe-stone branch of the Little Sioux river of the Missouri; one of these, however, *was found on the banks of the Rio de la Plata, in South America*; several were found in the territory now called New England, and in the north-eastern part of the continent." Unfortunately the specimen alluded to as having been found in South America, is probably lost, as the collection has long since been dispersed. It is, therefore, impossible, at this late day, to substantiate the statement quoted above.

Through the kindness of Professor W. H. Pratt, of Iowa, I have been enabled to procure photographs, sketches and accurate descriptions of a most interesting series of catlinite pipes belonging to the museum of the Davenport Academy of Sciences. A careful study of this collection reveals two important facts: First, that catlinite is not always distinguished by a red color, but that varieties sometimes occur of brown, slaty or greenish hues; second, that the forms of some of the older pipes, when considered in connection with the circumstances of their discovery, would indicate a much longer acquaintance with this material, on the part of the North American tribes, than has hitherto been supposed probable. The set of *modern* Indian pipes in this collection comprises specimens of a bright red color, others of a dark red or brown, and several of an ash or darker slate color, sometimes approaching a greenish tinge. As the red color has generally been considered one of the distinguishing characteristics of catlinite, some doubt might naturally be entertained as to the identity of the material of the latter, were it not for the fact that there are examples in the collection which are partially red and partially ash colored, and which are undoubtedly true catlinite. Such specimens combine in one piece the characteristics of several varieties of the stone, and present a mottled or variegated appearance. "In 1838," remarks my informant, Mr. Pratt, "*Little Crow* made a pipe while stopping a day or two at the house of Mr. Pope, then living near Fort Snelling, and presented it to the latter. It is of the dark ash color, and closely resembles some of our specimens in color and texture, but somewhat darker than any of them, and not in the least red. It is of the common modern form

and is inlaid with lead." This pipe has been presented to the Academy, and the material is pronounced catlinite.

In addition to the recent pipes, the Davenport Museum contains "four red, three partly red and partly ash colored, and twelve wholly of ash color, but running in some to a slate color, considerably darker," all but three of which have been taken directly from mounds, and those three found in their immediate vicinity. One of the most interesting specimens of these earlier forms yet brought to my notice, is the wild-cat pipe, from the Toolesboro' mound, represented in Fig. 9 (museum No. 4558)

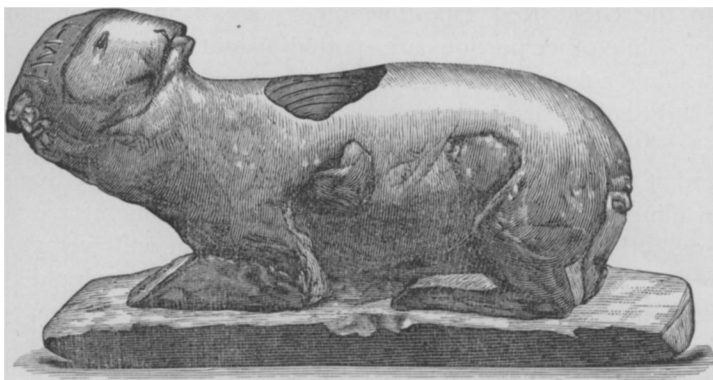


FIG. 9.—Antique pipe from a Toolesboro' mound, Iowa.

which is made of a variegated pipestone of a dull red or brown color, mottled with patches and spots of ash, some gray, greenish and light red. This was found associated with copper implements and pieces of galena.

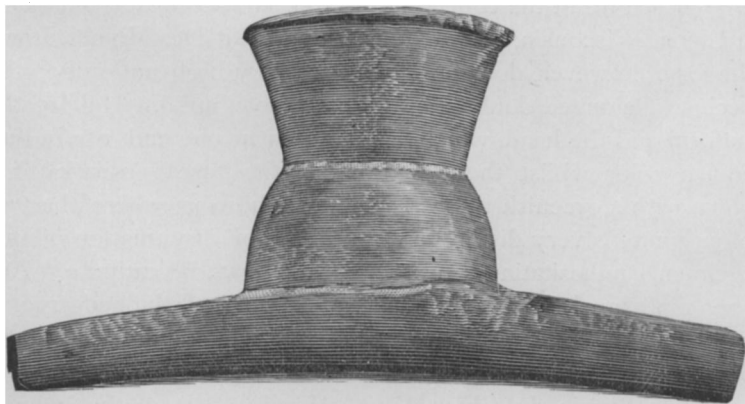


FIG. 10.—From a mound near Davenport, Iowa.

Another example shown in Fig. 10 (museum No. 4575), a com-



mon form in the oldest mounds, is made of a very dark red pipestone, polished, from an extensive mound in Rockingham township, six miles south-west of Davenport. Three other specimens from mounds in Louisa county, Iowa, belong to Mr. C. T. Lindley, but are at present deposited in the same museum. One is a bird-shaped pipe of a bright dark red color; another is also of the bird form, but is of a solid gray color; the third is also gray and plain.

Dr. C. A. White, in a recent letter to Mr. Pratt, writes: "You are quite right in supposing that some portions of the pipestone from the Great Red Pipestone quarry are of an ash or similar color, while other portions are spotted or mottled, or both. The prevailing color is red, the color so commonly seen in pipes, and the light colors are rather rare. It is not improbable that the layer which furnished the best material for pipes may have been found at certain local spots to have had a lighter shade than the prevailing color, so that there might at certain times have been more of that color found than the whole deposit will average. In short, so far as color is concerned, I do not know why all the specimens you refer to may not have come from the Great Red Pipestone quarry."

After a thorough study and comparison of the various specimens of this collection, both modern and ancient, Mr. Pratt assures me that beyond doubt the material of all the pipes alluded to or described above is true catlinite.

A human headed pipe four and a half inches in length and three in height, in the collection of Hon. Horace Beach, of Prairie du Chien, Wisconsin, was found in a mound at Des Moines, Iowa. The form, however, does not indicate a very high antiquity; the specimen belonged doubtless, to an intrusive burial. Half of the platform and the head, which is situated near one end, is of a dull reddish color, whilst the other half of the base is a dark olive brown with a greenish tinge. The line, showing where the two colors unite, is very distinct. After a careful examination of this specimen I unhesitatingly pronounce the material catlinite. Another pipe bowl from the same collection is fashioned from a bright olive colored variety of catlinite, in which numerous small spots of a lighter color are visible. This pipe was taken from a mound in Prairie du Chien, Wis. Mr. Beach is of the opinion that it was a Winnebago production, belonging to a secondary

burial, the material probably being obtained from the northern part of the State. A third example, belonging to the same gentleman, is a very diminutive pipe, an inch in length, shaped in imitation of an Indian moccasin. It was evidently intended to be used without the intervention of a movable stem or mouth-piece, the material being apparently catlinite of a dark reddish-brown color, the stem orifice passing through the toe. It was found near Fond du Lac, Wisconsin.

Henry G. Clay, Esq., of Philadelphia, has a catlinite pipe made in the semblance of a bear's paw, with inlaid ornamentation. Mr. H. F. Sibley, of Fairfield, Ill., is the possessor of a catlinite calumet which measures six and a half inches in length. It was found in Minnesota. Another example in the same collection is a diminutive pipe which was discovered in a cave in Kansas. In a group of mounds in Rock Island county, Illinois, at a depth of seven or eight feet, were recently found two other pipes made of the dark red pipestone. One of these is unfinished, having no perforation leading to the bowl. The other possesses a round bowl with the head of an animal, somewhat resembling a mouse, carved on one side. In the latter specimen the eyes of the animal are not indicated, and the stem hole does not reach entirely through the bowl. These two last-mentioned examples have been placed in the Davenport Academy.

Amongst nearly two hundred pipes, discovered by Squier and Davis in a small sacrificial mound in Ohio, were many "composed of a red porphyritic stone, somewhat resembling the pipestone of the Côteau des Prairies, excepting that it is of great hardness and interspersed with small, variously-colored granules." When it is known that catlinite becomes hardened by long use and exposure to fire, there are strong reasons for believing that the "red porphyritic stone," several times mentioned in the "Ancient Monuments of the Mississippi valley," was in reality a variety of the true red pipestone. Some of the limestone pipes had been entirely calcined by the heat "which had been sufficiently strong to melt copper.

In support of the assertion that catlinite often occurs of colors other than red, Professor Crane writes me that he has taken specimens of this material from the great quarry which are pure white, and also pieces exhibiting every shade of color between this and deep red, including an ash-colored variety. A series of speci-

mens of the stone, which he procured at the quarry, and which he has sent to me for examination, includes a large number of varieties, differing considerably in density, some pieces resembling clay in softness, and others approaching jasper in hardness. In this selection specimens are found of a light buff or rich cream color; others present the various shades of red, whilst some are of a dark ash or slate color. Pebbles of great hardness, which were found in the drift close by, present the same diversity in coloring, and one example, of a deep red hue, is beautifully mottled with circular spots of a lighter shade. Many of the specimens of pipestone are variegated with small spots of a lighter or pink color, while others are buff on one side and flesh colored or dark red on the other. Says Dr. Hayden: "This rock possesses almost every color and texture, from a light cream to a deep red, depending upon the amount of peroxyd of iron. Some portions of it are soft, with a soapy feel, like steatite, others slaty, breaking into thin flakes; others mottled with red and gray."<sup>1</sup>

An examination of the several varieties of the stone, however, shows us that the deep red portions of the pipestone stratum are the finest in quality and best adapted for pipe sculpture, which fact will account for the prevalence of pipes of this color.

It has hitherto been generally supposed that catlinite was only found in one contracted locality—at the Great Red Pipestone quarry; but varieties of the same mineral occur at several points in Dakota, Minnesota and Wisconsin. Dr. White writes of it as occurring at Sioux falls, Minnehaha county, Dakota, where it is "intercalated with the red quartzite." Mr. Pratt informs me that the largest specimen block of red pipestone in the Davenport cabinet is from Blue Earth river, about seventy-five miles east of the quarry, and Professor J. D. Butler describes a pipestone, almost identical with the catlinite of *Côteau des Prairies*, which occurs in Sauk county, and also in Brown county, Wisconsin, at the head of Green bay. Professor N. H. Winchell, the Minnesota State geologist, writes Mr. Pratt that real catlinite is also found, *in situ*, at several points in Minnesota, in Pipe Stone Rock, Cottonwood, Watonwan and Nicollet counties, and sparingly at Pokegama falls. He also mentions it as occurring at the Great Palisades, in Dakota and in some parts of Wisconsin. Dr. Hoy, of Racine, states that "there is quite an extensive quarry of catlinite in the

<sup>1</sup> *Am. Jour. Sci. and Arts*, Jan., 1867, p. 20.

northern part of Wisconsin; color a little darker than the western variety; some specimens are dark ash colored." According to the Geological Report of Wisconsin for 1877, pipestone occurs also in considerable quantities in Barron county.

It will thus be seen that the native pipe makers were not limited to one particular locality to procure their material. It is not to be supposed that all of these deposits were known to them in olden times, but detached fragments might have supplied them with material in many places. It is highly probable that pipestone has been used by the inhabitants of North America for centuries, and was perhaps obtained at first in small pieces from the drift of the Missouri and Dakota valleys, long before the Great Pipestone quarry was worked and previous to the discovery of the stone *in place*. According to Dr. White,<sup>1</sup> ledges of catlinite are found in the north-western corner of Iowa, and the red quartzite which overlies them is found scattered in boulders as far as the Missouri State line, a distance of over two hundred miles. Professor Chamberlin, State geologist of Wisconsin, writes, in a letter to Mr. Pratt, "Catlinite occasionally occurs in our drift."

In reviewing the facts thus briefly stated it will be seen that the stone of *Côteau des Prairies* and the adjacent territory must have been employed by native sculptors for several centuries at least, and, in all probability, for a much longer period. The early writers frequently allude to a peculiar substance commonly used by the Indians in the pipe manufacture, which without difficulty may be identified as catlinite. There can be no doubt that an extensive traffic was carried on in this material for a considerable length of time by the aboriginal tribes, extending from the Atlantic coast to the Rocky Mountain system, and from New York and Minnesota on the north to the Gulf of Mexico. The fact that objects of catlinite have been taken from Indian graves in the State of New York, and that others were found on the ancient site of an abandoned village in Georgia, at opposite points, twelve hundred miles distant from the pipestone quarry of Minnesota, reveals the great extent of intercommunication which formerly existed amongst the North American peoples. When we consider the fact that many pipes of catlinite have been taken from the bottom of mounds from four to seven feet deep, where they were found in connection with cloth-wrapped copper axes

<sup>1</sup> AMER. NAT., Vol. II, p. 644.

and other objects of a high antiquity, and that some of them are of the typical form of the oldest mound pipes, viz.: A cylindrical or sculptured bowl rising from the center of the convex side of a curved platform, we are forced to believe that their age is very considerable.<sup>1</sup>

It is highly probable that future investigations may point to a still greater antiquity of the art of fashioning objects in pipestone than has been positively assigned to it in these pages, and, indeed, it is within the range of possibility that the aboriginal operations at the Great Pipestone quarry may be proved to have antedated the Spanish discovery of America by many centuries.

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### EDITORS' TABLE.

EDITORS: A. S. PACKARD, JR., AND E. D. COPE.

— The unification of geological nomenclature, and of the system of colors used for geological maps, are two objects which the International Congress of Geologists has proposed to accomplish. So far as the nomenclature of the formations is concerned, the only *doubles emplois* which occur, and which are likely to occur, are to be found in the different names given by geologists to the same formation when they exist in different continents. Such duplications are not very numerous, but they are sufficiently so to demand attention. The only attempt in this direction of unification with which we are acquainted, is to be found in the first volume of the *Comptes Rendus* of the Congress, Paris, 1868.<sup>2</sup> It was there maintained that while the lesser sub-divisions of the formation of Europe and America can rarely be identified, those of primary and secondary grade are often clearly the same, and should bear the same name on both continents. The general adoption of the uniform nomenclature may be greatly facilitated by its recommendation by the Congress of Berlin.

A general uniformity in the system of geological coloration has long prevailed, but in detail there is much discrepancy. At present there are three principal systems in use: those of the committees which reported to the Congress of Bologna; that of the United States Geological Survey, and that of the Geological Sur-

<sup>1</sup> For other objects of pipestone not described here, see proceedings of the Davenport Academy of Sciences, Vol. 1, pl. IV.

<sup>2</sup> Comparison of the horizons of extinct vertebrata of Europe and America.